# PUBLIC SERVICE COMMISSION OF MARYLAND

# RENEWABLE ENERGY PORTFOLIO STANDARD REPORT OF 2010

With Data for Compliance Year 2008

In compliance with Section 7-712 of
the Public Utility Companies Article,
*Annotated Code of Maryland*

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# I. INTRODUCTION

## A. Report Contents

This document constitutes the 2010 annual report of the Public Service Commission of Maryland (Commission) regarding the Maryland Renewable Energy Portfolio Standard (RPS Program). This report is submitted pursuant to § 7-712 of the Public Utility Companies Article, *Annotated Code of Maryland* (PUC Article). Section 7-712 of the PUC Article requires that, on or before February 1 of each year, the Commission shall report to the General Assembly on the status of the implementation of the RPS program. The electric suppliers are not required to file an RPS compliance report with the Commission for the prior calendar year until April 1 of the next year. Consequently, this 2010 report highlights data from electric suppliers' 2008 compliance reports and relevant 2009 data such as the renewable facilities certified by the State of Maryland.

In compliance with § 7-712 of the PUC Article, topics addressed in this report include the availability of Tier 1, Tier 1 solar, and Tier 2 renewable energy sources, renewable compliance fees collected to support in-State renewable projects, and other pertinent information. The report also provides historical information and accomplishments over the past year.

## B. Objectives of the Program

The objective of §7-701 *et seq.* of the PUC Article (RPS Statute) is to recognize and develop the benefits associated with a diverse collection of renewable energy supplies to serve Maryland. The State's RPS Program does this by recognizing the environmental and consumer benefits associated with renewable energy. The RPS Program requires retail suppliers of electricity to meet a prescribed minimum portion of their energy supply needs with various renewable energy sources, which have been classified within the RPS Statute as Tier 1 and Tier 2 renewable sources. The program is implemented through the creation, sale and transfer of Renewable Energy Credits (RECs). The development of renewable energy sources is further promoted by requiring electricity suppliers to pay a financial penalty for failing to acquire sufficient RECs to satisfy the RPS as set forth in §7-703 of the PUC Article. The penalty is used to support the creation of new Tier 1 renewable sources in the State.

## C. Overview of the Maryland RPS Program

Under the RPS Program, electricity suppliers are required to meet a renewable energy portfolio standard. This is an annual requirement placed upon Maryland Load Serving Entities (LSEs), which include electricity suppliers and the utilities that provide Standard Offer Service.[1] LSEs file compliance reports with the Commission verifying that the renewable requirement for each entity is satisfied.

[1] Standard Offer Service ("SOS") is electricity supply purchased from an electric company by the company's retail customers that cannot or choose not to transact with a competitive supplier operating in the retail market. *See* PUC Article §§ 7-501(n), 7-510(c).

Each supplier must present, on an annual basis, RECs equal to the percentage specified by the RPS Statute,[2] or pay compliance fees equal to shortfalls. A REC is equal to one megawatt-hour (MWh) of electricity generated using specified renewable sources. As such, a REC is a tradable commodity equal to one MWh of electricity generated or obtained from a renewable energy generation resource. Generators and suppliers are allowed to trade RECs using a Commission-approved system known as the Generation Attributes Tracking System (GATS). GATS is a system designed and operated by PJM Environmental Information Services, Inc (PJM-EIS) that tracks the ownership and trading of the generation attributes.[3] A REC has a three-year life during which it may be transferred, sold or redeemed. Suppliers that do not meet the annual RPS requirement are required to pay compliance fees.

Compliance fees are deposited into the Maryland Strategic Energy Investment Fund (SEIF or Energy Fund) as dedicated funds to provide for loans and grants that can indirectly spur the creation of new renewable energy sources in the State.[4] As a special, non-lapsing fund, the SEIF is also the depository of revenues generated through the sale of carbon allowances under the Regional Greenhouse Gas Initiative (RGGI). Indeed, the majority of the SEIF funds result from the RGGI carbon dioxide allowance auctions. Auctions are held quarterly; the initial six auctions held between September 2008 and December 2009 yielded proceeds totaling $96,271,577.[5] At least 6.5 percent of the funds from the RGGI allowances sold between March 1, 2009 and June 30, 2011 are to be allocated to renewable and clean energy, climate change programs, and energy related public education and outreach programs.[6]

Responsibility for developing renewable energy sources has been vested with the Maryland Energy Administration (MEA). MEA advises that due to delayed appropriation approval, no renewable projects were supported by the Energy Fund either through dedicated funds (*i.e.*, RPS compliance fees) or RGGI auction revenues as of the end of calendar year 2008.[7]

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2 Using the Tier 2 RPS requirement as an example, assume a hypothetical LSE operating in the State had 100,000 MWh in retail electricity sales for 2008. In 2008 the Tier 2 requirement was 2.5 percent. Thus, the LSE would have to verify the purchase of 2,500 Tier 2 RECs in satisfaction of the Tier 2 RPS obligation, or pay compliance fees for deficits. Similar requirements apply to Tier 1 and Tier 1 solar: the additional RPS tiers provided for in Maryland's RPS Statute.

3 An attribute is "a characteristic of a generator, such as location, vintage, emissions output, fuel, state RPS program eligibility, etc." PJM Environmental Information Services, Generation Attribute Tracking System (GATS) Operating Rules, Revision 5, at 3 (December 8, 2008).

4 Chapters 127 and 128 of the Laws of 2008 repealed the Maryland Renewable Energy Fund and redirected compliance fees paid into that fund into the Maryland Strategic Energy Investment Fund.

5 Regional Greenhouse Gas Initiative, CO2 Auctions, Auction Results, Available: http://www.rggi.org/docs/MD_Proceeds_by_Auction_091204.pdf (January 8, 2010).

6 Maryland General Assembly, The Budget Reconciliation and Financing Act of 2009, Chapter 487 of 2009, Available: http://mlis.state.md.us/2009rs/billfile/hb0101.htm (December 21, 2009). An allocation of up to 10.5 percent of the RGGI funds is provided for in subsequent auctions.

7 MEA began using funds from the RPS Alternative Compliance Penalties in the fiscal year beginning July 1, 2009. From July 1, 2009 through February 1, 2010, approximately $600,000 from Alternative Compliance Penalties and $3.4 million of the RGGI auction revenues, also a component of the SEIF, were used to fund new Tier 1 renewable energy resources in Maryland. The grants from ACPs supported the installation of 400 kilowatts (0.400 megawatts) of solar photovoltaic (PV) capacity. RGGI auction proceeds supported an additional 888 kilowatts (0.888 megawatts) of solar PV and 65 kilowatts (0.065 megawatts) of small-wind energy systems. Source: MEA, Maryland Public Service Commission data request response, February 24, 2010.

1. Registration of Renewable Energy Facilities

Facilities eligible for the Maryland RPS Program must be located in PJM (*i.e.*, the wholesale bulk power control area in which Maryland resides);[8] in a state adjacent to the PJM region; or in a control area that is adjacent to the PJM region,[9] so long as the electricity is delivered into the PJM region.[10] To certify a Renewable Energy Facility (REF), Commission Staff must determine whether the facility meets the standards set forth by the Maryland RPS Program. Applicants potentially qualifying under Maryland's RPS Program initially work with Commission Staff and complete the appropriate application for renewable energy facility certification posted on the Commission's RPS website.[11] In addition to the geographic requirement, applicants must also meet the fuel source requirements associated with Tier 1 and Tier 2 REC creation. Verification of the fuel source is usually completed with the aid of Energy Information Administration Form 860 (EIA-860) to validate each facility's rated nameplate capacity, fuel source(s), location and commercial operation start date.[12]

Facilities must register with GATS to transact business and to have RECs recognized and created. The GATS account must be established with the State facility certification number issued by the Commission upon approval of the REF application. Facilities that co-fire a REC-eligible renewable fuel source with non-eligible fuel sources must submit a formula or method to account for the proportion of total electricity generation that will be credited with RECs. A comprehensive listing of REFs currently certified with the Maryland RPS Program can be found in Appendix E. Eligible fuel sources for Tier 1 RECs and Tier 2 RECs are listed in Table 1. Solar has its own standard within Tier 1.

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[8] The PJM wholesale market includes all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia.

[9] A control area is "an electric system or systems, bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas and contributing to frequency regulation. A control area is defined in broad terms to include transmission system operations, market, and load-serving functions within a single organization. A control area operator may be a system operator, a transmission grid operator, or a utility." PJM Environmental Information Services, Generation Attribute Tracking System (GATS) Operating Rules, Revision 5, at 5 (December 8, 2008). For example, the multi-state area controlled by the PJM Regional Transmission Operator is one control area, as is the adjacent Midwest Independent System Operator (ISO) multi-state area, and the adjacent New York ISO.

[10] Chapters 125 and 126 of the 2008 Session modify the geographic region of eligible renewable resources provided for within PUC § 7-701(i). Effective January 1, 2011, the geographic scope in which renewable resources can be located will be restricted within the PJM region or in a control area adjacent to the PJM region, if the electricity is delivered into the PJM region. That is, renewable energy facilities located in states adjacent to the PJM control area will not have RECs qualify for Maryland's RPS unless the underlying electricity is delivered into the PJM region.

[11] Solar and standard REF applications are maintained by the Commission and are available online. Maryland Public Service Commission, Renewable Portfolio Standard Documents, Available: http://webapp.psc.state.md.us/intranet/ElectricInfo/home_new.cfm.

[12] Submitting Form EIA-860 is a requirement under Section 13(b) of the Federal Energy Administration Act of 1974 (FEAA) (Public Law 93-275) for generating plants, regulated and unregulated, which have a nameplate rating of 1 MW or more, are operating or plan to operate within 5 years, and are connected to the transmission grid.

## Table 1: Eligible Tier 1 and Tier 2 Resources

| Tier 1 Renewable Sources | Tier 2 Renewable Sources |
|---|---|
| • Solar (Tier 1 solar)<br>• Wind<br>• Qualifying Biomass<br>• Methane from a landfill or wastewater treatment plant<br>• Geothermal<br>• Ocean<br>• Fuel Cell that produces electricity from a Tier 1 source<br>• Hydroelectric power plant less than 30 MW capacity<br>• Poultry litter-to-energy | • Hydroelectric power other than pump storage generation<br>• Waste-to-energy<br><br>*Note: Tier 1 RECs may be used to satisfy Tier 2 obligations.* |

2. Maryland RPS Annual Percentage Requirements

Electricity suppliers are required to purchase specified minimum percentages of their electricity resources via RECs from Maryland-certified Tier 1 and Tier 2 renewable resources. Tier 1 and the Tier 1 solar set-aside requirements gradually increase until they peak in 2022 at 18 percent and 2 percent, respectively, and are subsequently maintained at those levels.[13] Maryland's Tier 2 requirement remains constant at 2.5 percent through 2018, after which it sunsets.

## Table 2: Annual RPS Requirements by Tier

| Compliance Year | Tier 1* | Tier 1 Solar | Tier 2 |
|---|---|---|---|
| 2008 | 2.00% | 0.005% | 2.50% |
| 2009 | 2.00% | 0.010% | 2.50% |
| 2010 | 3.00% | 0.025% | 2.50% |
| 2011 | 4.96% | 0.040% | 2.50% |
| 2012 | 6.44% | 0.060% | 2.50% |
| 2013 | 8.10% | 0.100% | 2.50% |
| 2014 | 10.15% | 0.150% | 2.50% |
| 2015 | 10.25% | 0.250% | 2.50% |
| 2016 | 12.35% | 0.350% | 2.50% |
| 2017 | 12.55% | 0.550% | 2.50% |
| 2018 | 14.90% | 0.900% | 2.50% |
| 2019 | 16.20% | 1.200% | |
| 2020 | 16.50% | 1.500% | |
| 2021 | 16.85% | 1.850% | |
| 2022 | 18.00% | 2.000% | |

* Does not include the solar set-aside (Tier 1 Solar)

[13] "Tier 1 solar set-aside" refers to the set-aside (or carve-out) of Tier 1 for energy derived from a qualified solar energy facilities. The Tier 1 solar set-aside requirement applies to retail electricity sales in the State by electricity suppliers and is a sub-set of the Tier 1 standard.

An electricity supplier can make a request of the Commission to consider a delay in scheduled Tier 1 and Tier 1 solar RPS requirements provided certain renewable procurement cost thresholds are met.[14] To date, no request to delay scheduled RPS compliance requirements has been made by electric suppliers operating in the Maryland marketplace.

3. Maryland RPS Alternative Compliance Penalty Requirements

Suppliers of electricity not meeting the RPS standard pay an Alternative Compliance Penalty (ACP) for shortfalls, as seen in Table 3. Table 3 presents the ACP schedule separated by tiers for each year of the RPS from 2008 to 2023 and beyond. Compliance fees, as previously mentioned, are submitted to the Energy Fund and dedicated to supporting the development of new Tier 1 renewable resources in Maryland. The Tier 1 compliance fee is $20 per MWh for 2008 to 2010 compliance years, and then doubles to $40 per MWh for all subsequent years. The Solar Tier 1 ACP was set at $450 per MWh shortfall for the 2008 compliance year, then decreases by $50 per MWh every other subsequent year until reaching a $50 per MWh base for the 2023 compliance year and all subsequent years. The Tier 2 compliance fee is $15 per MWh from 2008 until the sunset of the standard in 2018. There is a separate compliance fee for Industrial Process Load (IPL) Tier 1 shortfalls only.

**Table 3: ACP Schedule ($/MWh)**

| Compliance Year | Tier 1 (non-solar) | Solar Tier 1 | Tier 2 | IPL* Tier 1 |
|---|---|---|---|---|
| 2008 | $20 | $450 | $15 | $8 |
| 2009 | $20 | $400 | $15 | $5 |
| 2010 | $20 | $400 | $15 | $5 |
| 2011 | $40 | $350 | $15 | $4 |
| 2012 | $40 | $350 | $15 | $4 |
| 2013 | $40 | $300 | $15 | $3 |
| 2014 | $40 | $300 | $15 | $3 |
| 2015 | $40 | $250 | $15 | $2.50 |
| 2016 | $40 | $250 | $15 | $2.50 |
| 2017 | $40 | $200 | $15 | $2 |
| 2018 | $40 | $200 | $15 | $2 |
| 2019 | $40 | $150 | | $2 |
| 2020 | $40 | $150 | | $2 |
| 2021 | $40 | $100 | | $2 |
| 2022 | $40 | $100 | | $2 |
| 2023 + | $40 | $50 | | $2 |

* According to PUC §7-705 b (2) and COMAR 20.61.06 E (5), a supplier sale from Industrial Process Load is required to meet the entire Tier 1 obligation for electricity sales, including solar. However, the ACP for an IPL Tier 1 non-solar shortfall and a Tier 1 solar shortfall is the same. For IPL there is no compliance fee for Tier 2 shortfalls.

[14] PUC § 7-705.

## II. SUPPLIER COMPLIANCE REPORTS

Calendar year 2008 marked the third compliance year for the Maryland RPS, and the first year for LSEs to comply with the solar Tier 1 set-aside. The RPS compliance reports submitted to the Commission by LSEs and GATS provide information regarding the RECs retired and the underlying renewable energy facilities (*e.g.*, type and location) utilized by electricity suppliers to comport with Maryland RPS obligations.[15] RPS compliance reports were filed by 72 electricity LSEs, including 11 utilities, 33 suppliers, and 28 brokers. RPS compliance reports are due by April 1st every year. There was approximately 64 million MWh of total retail electricity sales in Maryland for 2008: 59.2 million MWh were subject to RPS compliance, and 5 million MWh were exempt.[16]

For the 2008 compliance year, electricity LSEs retired 2,684,815 RECs, which was greater than the obligation for the year by over 19,000 RECs. According to the compliance reports filed with the Commission, the cost of RECs retired totaled $2,039,583 for the 2008 compliance year. Comparable REC price data was not collected in 2006 or 2007.[17] For the three compliance years, Table 4 displays the breakdown of RECs submitted for each tier (MWh), the number of RECs retired in the year by tier (MWh); as well as the payments for the shortfalls in terms of the ACP amount required ($ per MWh).[18] The estimated total costs of all 2008 RECs retired for compliance was just over $2 million and the remaining RPS obligations accrued an ACP balance of $1,241,365.[19]

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[15] According to PUC Article 7-709, a REC can be diminished or extinguished before the expiration of three years by: the electricity supplier that received the credit; a nonaffiliated entity of the electricity supplier that purchased or otherwise received the transferred credit; or demonstrated noncompliance by the generating facility with the requirements of PUC Article 7-704 (f). In the PJM region, the regional term of art is "retirement," and describes the process of removing a REC from circulation by the REC owner, *i.e.*, the owner "diminishes or extinguishes the REC." PJM Environmental Information Services, Generation Attribute Tracking System (GATS) Operating Rules, at 52-54 (December 8, 2008).

[16] According to PUC Article §7-703(a)(2), exceptions for the RPS requirement may include: industrial process load which exceed 300,000,000 kWh to a single customer in a year; regions where residential customer rates are subject to a freeze or cap (under PUC § 7-505); or electric cooperatives under a purchase agreement that existed prior to October 1, 2004, until the expiration of the agreement.

[17] For the 2008 compliance year, the Commission issued data requests to the electricity suppliers in order to supplement the 2008 Annual Supplier Reports with specific REC price data, including Tier 1, Tier 1 Solar, and Tier 2 price data. The 2009 Annual Supplier Reports, due April 1, 2010, now explicitly request this REC price data.

[18] The RPS obligation is the total obligation for electricity sales in MWh, which is equal to the number of RECs required for compliance. The number of retired RECs is the actual number of RECs retired for RPS compliance in each corresponding compliance year. The ACP required is calculated by multiplying the difference between the RPS obligation and the actual retired RECs (*i.e.*, the shortfalls) by the applicable ACP and is denominated in U.S. dollars.

[19] LSEs can meet RPS obligations through the retirement of RECs or by paying ACPs. LSEs are required to report the total cost of purchasing RECs for compliance.

## Table 4: Results of the RPS Compliance Reports

| RPS Compliance Year | | Tier 1 (non-solar) | Tier 1 Solar | Tier 2 | Total |
|---|---|---|---|---|---|
| 2006 | RPS Obligation (MWh) | 520,073 | - | 1,300,201 | 1,820,274 |
| | Retired RECs (MWh) | 552,874 | - | 1,322,069 | 1,874,943 |
| | **ACP Required** *($/MWh)* | **$13,293** | **-** | **$24,917** | **$38,209** |
| 2007 | RPS Obligation (MWh) | 553,612 | - | 1,384,029 | 1,937,641 |
| | Retired RECs (MWh) | 553,374 | - | 1,382,874 | 1,936,248 |
| | **ACP Required** *($/MWh)* | **$12,623** | **-** | **$23,751** | **$36,374** |
| 2008 | RPS Obligation (MWh) | 1,183,439 | 2,934 | 1,479,305 | 2,665,678 |
| | Retired RECs (MWh) | 1,184,174 | 227 | 1,500,414 | 2,684,815 |
| | **ACP Required** *($/MWh)* | **$9,020** | **$1,218,739** | **$8,175** | **$1,235,934** |

Notably, in 2008 there was a shortfall of 2,707 MWh in RECs for the initial year of the Solar Tier 1 requirement of 2,934 MWh. This shortfall appears largely attributable to the timing of SOS procurement contracts. For residential and small commercial SOS, three of the four Maryland investor-owned utilities purchase two-year supply contracts via competitive bids conducted twice each year.[20] The statute governing the RPS was amended during the Maryland General Assembly's 2007 session to include a specific Tier 1 solar RPS requirement starting January 1, 2008,[21] which occurred during the effective period of a number of existing two-year SOS procurement contracts.[22] Over 98 percent of the total ACPs for the 2008 compliance year are from Solar Tier 1 shortfalls,[23] and the degree to which solar technologies are available to provide renewable output plays a role in the Tier 1 Solar compliance option selected.[24]

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[20] The Potomac Edison Company d/b/a Allegheny Power has been in a transition mode purchasing 5-month to 29-month contracts for its residential and small commercial SOS via competitive bids conducted up to four times a year.

[21] Chapters 119 and 120, Acts 2007, codified at Md. Code Ann., PUC, §7-703.

[22] Normally renewable electricity (*i.e.*, the RECs) is provided to the utilities as a product component within the wholesale power purchase agreements. However, an SOS service year runs for a 24 month contract term and straddles two RPS compliance years (in this case calendar years 2008 and 2009). In the event the RPS requirement is increased, the contracts supporting SOS require the utilities and suppliers to meet via a stakeholder process to consider terms under which the wholesale suppliers could supply the incremental RPS requirement, but ultimately leave it up to the Commission to determine how this requirement will be met. Stakeholders proposed to have the utilities pay the statutory penalty for noncompliance (*i.e.*, the alternative compliance payment or ACP) with the RPS Tier 1 solar requirement for the period from June 1, 2008 through December 31, 2008. The Commission approved the stakeholder proposal. For the period covering January 1, 2009 through May 31, 2009, the stakeholders proposed to develop and conduct a competitive bid to purchase the needed SRECs.

[23] Of the remaining portion of ACPs (non-solar) paid, 94 percent was provided by one LSE.

[24] As noted above, LSEs can meet RPS obligations by either purchasing available RECs or paying the ACP. For SOS procurement auctions that had occurred before the solar requirement was enacted, it was too late to buy solar RECs for those SOS contracts. Therefore, only the default ACP option was available. However, currently parties are working to implement a supplemental procurement method for solar RECS for SOS contracts still operative that were procured before the enactment of the current solar REC requirement.

RECs used to comply with the Maryland RPS are valid for three years from the date created unless the REC is retired before expiration.[25] Figure 1 aggregates the Maryland RPS tiers on the basis of generation year. A small percentage of 2005 vintage RECs were retired within the 2008 compliance year. Nearly half of the RECs retired in 2008 (49 percent) were generated in 2006, approximately 31 percent of the retired RECs were generated in 2007; the balance of the RECs, approximately 16 percent, were generated in 2008. With the exception of the small percentage of 2005 vintage RECS, the number of RECs retired decreases for each subsequent generation year; as a result, a relatively small portion of the RECs retired were generated during the 2008 compliance year. Since the bulk of the RECs retired in 2008 were not generated in 2008, this indicates generators and/or suppliers are utilizing Maryland's three year banking provision.[26]

**Figure 1: 2008 Compliance Year RECs by Generation Year**

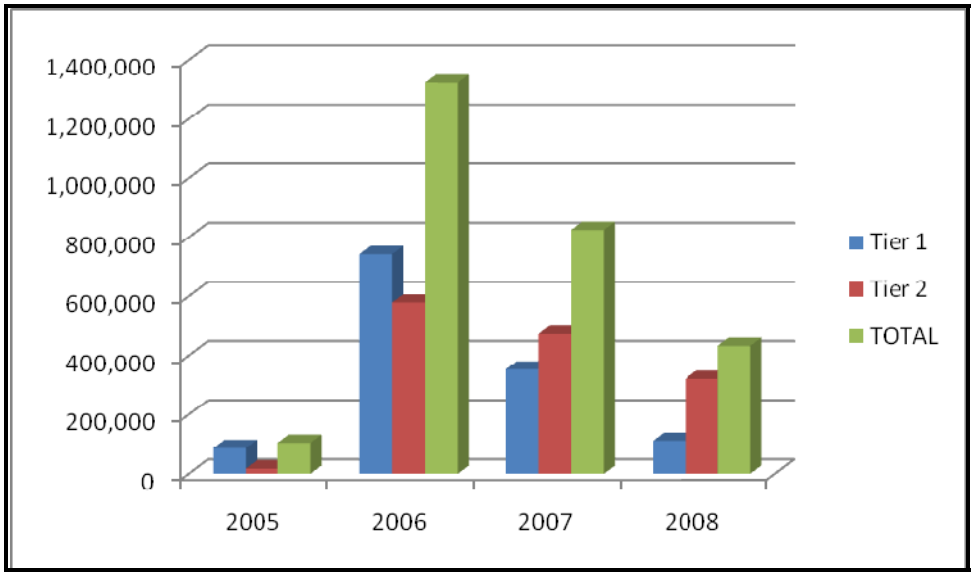



Figure 2 and Figure 3 illustrate for RPS compliance years 2008 and 2007, respectively, the fuel sources used to satisfy Tier 1 and Tier 2 RPS requirements, enabling a comparison of fuel sources used to meet each of the Maryland RPS tier requirements in those two years. Of the Tier 1 RECs retired for 2008, the principle resources used were black liquor-fueled resources that provided approximately 38 percent of the RECs;[27] waste wood, 30 percent; small hydro, 17 percent; and landfill gas, nearly 15 percent. Wind and solar resources account for less than one

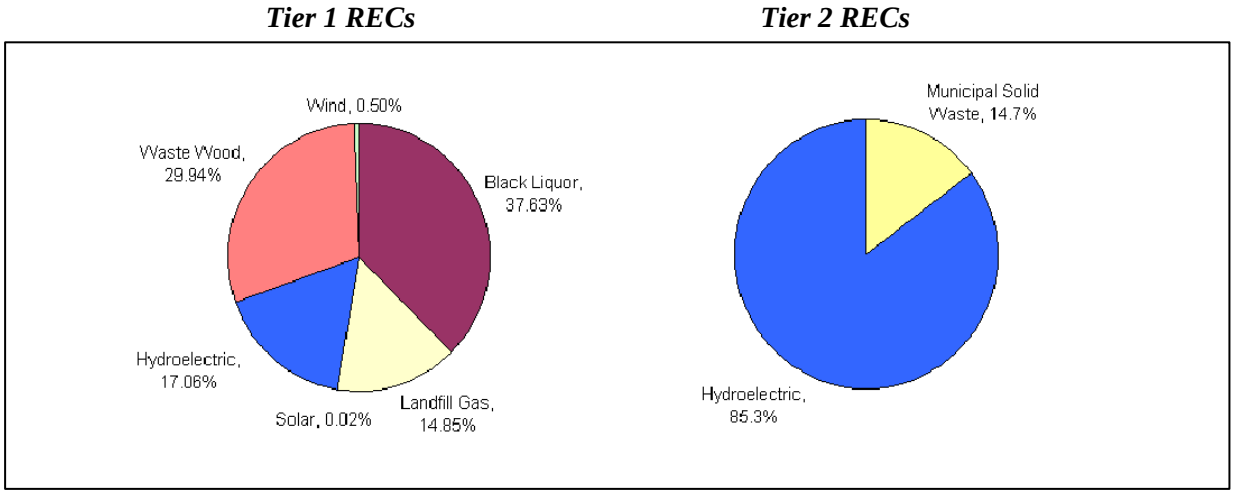
[25] According to PUC Article §7-709(d)(2); unless the REC is diminished or extinguished before expiration.

[26] Once a REC has been created, the generator can sell or transfer the REC to another GATS account, keep the REC active, or retire (extinguish) the REC. A REC which continues to be active beyond the GATS trading period can be accumulated and "banked" for use in subsequent compliance years.

[27] Black liquor is a waste byproduct from paper production.

percent of the RECs retired in 2008 for Maryland RPS compliance requirements.[28] Of the Tier 2 RECs retired for 2008, Figure 2 also reveals that hydroelectric facilities provided the bulk of the RECs: approximately 85 percent; while municipal solid waste provided nearly 15 percent of the RECs retired.

**Figure 2: 2008 Tier 1 & Tier 2 RECs Acquired by Fuel Source**




As in 2007, qualifying waste wood and black liquor were the predominant Tier 1 resources in 2008. Black liquor resources accounted for approximately 38 percent of the RECs retired in 2008, consistent with 2007 figures. Waste wood provided 30 percent of the 2008 Tier 1 RECs, compared with 35% in 2007; landfill gas provided 15 percent, compared with 21 percent in 2007. Small hydro resources contributed larger Tier 1 REC numbers in 2008. No wind or solar RECs were retired in 2007. With respect to Tier 2 RECs, more large hydroelectric was procured in 2008 than in 2007. Large hydroelectric and municipal solid waste fueled resources had contributed nearly equal amounts of RECs (*i.e.*, approximately a 50/50 percentage allocation) retired for 2007 Tier 2 RPS compliance requirements, in contrast with the 85 percent -15 percent split in 2008.

[28] The prices associated with RECs vary depending upon the renewable resource, because the various renewable technologies have different costs associated with electricity production. To minimize costs, LSEs tend to purchase lower priced RECs from lower cost renewable technologies first. The renewable fuel sources retired in Maryland for 2008 compliance (Figures 2 and 3) suggest such a strategy by market participants. Over time, as the RPS percentage standard increases and the opportunity to utilize low-cost technologies may become exhausted, the use of RECs from more expensive renewable resources is likely to occur (*e.g.*, wind, solar). Moreover, development of these more expensive renewable technologies may be incentivized. In addition to RECs used for RPS compliance, RECs are also sold to support green retail products that have large renewable energy amounts (*e.g.*, 100 percent wind). Customers may have a preference for energy from a specific technology and are willing to pay the price premium for these RECs over electricity from fossil fuel resources. Therefore, green power product currently available in the market and to retail customers also support higher cost renewable technologies.

**Figure 3: 2007 Tier 1 & Tier 2 RECs Acquired by Fuel Source**

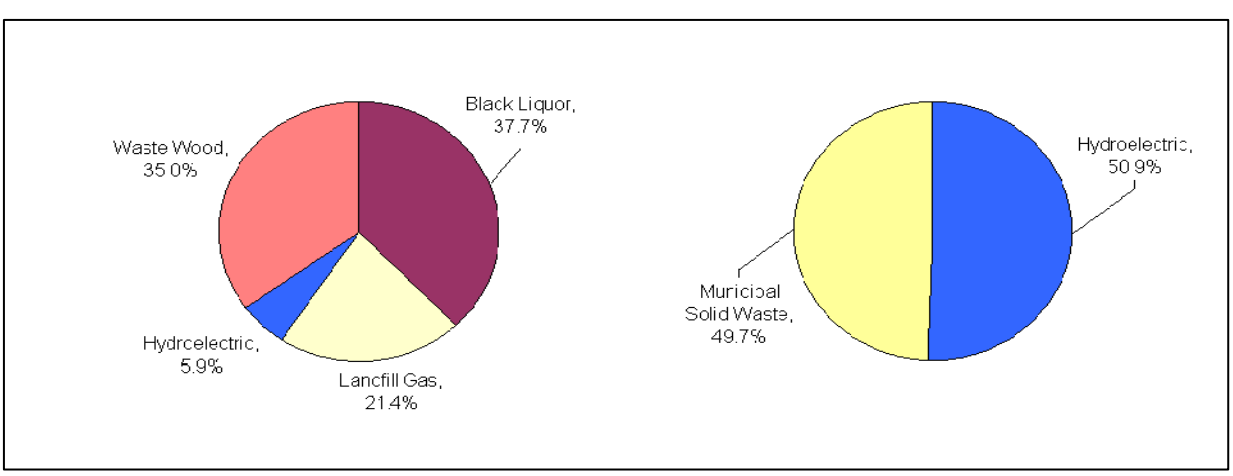
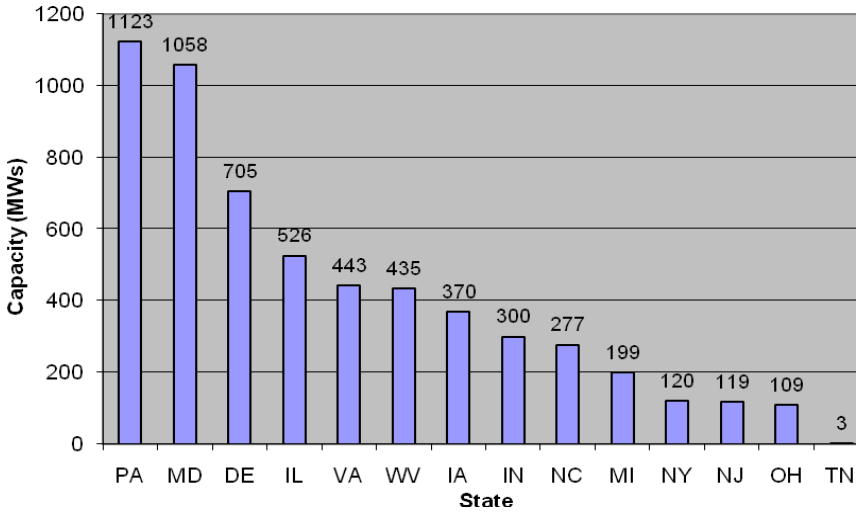



Figure 4 presents the geographical location and the total generating capacity (5,789 MW) for all Maryland RPS-certified facilities regardless of Tier.[29] RPS requirements also exist in the surrounding states, which generally supports out-of-state and regional market participation (see Appendix A). Seventy-five percent of the renewable facilities that are eligible to participate and potentially provide renewable energy in Maryland reside in the Mid-Atlantic states: Pennsylvania, 19 percent of the potential capacity; Maryland, 18 percent; Delaware, 12 percent; Illinois, 9 percent; Virginia, 8 percent; and West Virginia, 8 percent. The locations of the remaining eligible resources span eight states and in total contribute to 26 percent of the State's eligible capacity.

**Figure 4: Total Rated Capacity by State**[30]

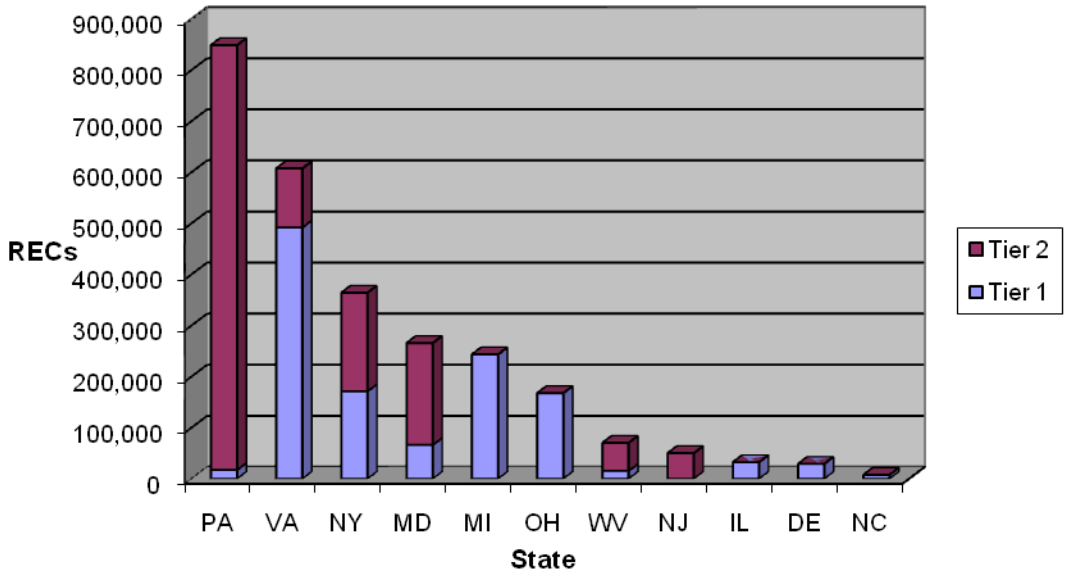



29 PJM-EIS, Generation Attribute Tracking System, Database query, February 2010.

30 The information in this figure comes from PJM GATS, and does not include Commission authorized REFs that have not established a REC account with PJM GATS.

For the 2008 compliance year, Figure 5 provides a visual display of aggregate REC data to convey general relationships among the States that contributed RECs in 2008. Pennsylvania supplied the largest number of RECs purchased by retail electricity suppliers. The majority of the Pennsylvania RECs were from Tier 2 facilities. Virginia was the second most plentiful source of RECs procured by Maryland electric suppliers; additionally, Virginia was the largest source of Tier 1 RECs retired for 2008 compliance purposes. New York, which supplied a relatively equal amount of Tier 1 and Tier 2 RECs, was ranked third in terms of state location for retired RECs. Notably, once statutory changes take effect in 2011, facilities in New York will only qualify to participate in the Maryland RPS if the electricity is delivered into the PJM region.

**Figure 5: Number of RECs Retired by Facility Location (2008)**




Tables 5 and Table 6 provide the quantitative data that supports Figure 5 above. Table 5 provides the reported levels of RECs retired by Maryland retail suppliers in 2008 on a tier and aggregate basis. As noted above, Pennsylvania-generated RECs, followed by Virginia and New York, were used in the largest aggregate amounts by Maryland electric suppliers for 2008 RPS compliance.[31] Tier 1 Maryland RECs retired include 227 Solar RECs.

[31] Table 5 provides the explicit number of RECs retired by state of origin, which would be difficult to read and compare in the Figure above.

**Table 5: 2008 Compliance Reports' REC Retirement by State**

| State | Tier 1 | Tier 2 | Total |
|---|---|---|---|
| **PA** | 17,287 | 831,424 | 848,711 |
| **VA** | 491,891 | 115,459 | 607,350 |
| **NY** | 171,308 | 192,929 | 364,237 |
| **MD** | 66,270* | 199,472 | 265,742 |
| **MI** | 243,317 | 0 | 243,317 |
| **OH** | 167,515 | 0 | 167,515 |
| **WV** | 15,378 | 54,760 | 70,138 |
| **NJ** | 0 | 50,001 | 50,001 |
| **IL** | 32,305 | 0 | 32,305 |
| **DE** | 29,165 | 0 | 29,165 |
| **NC** | 7,406 | 0 | 7,406 |
| **TOTAL** | **1,241,842*** | **1,444,045** | **2,685,887** |

** This includes 227 Tier 1 Solar RECs.*

Table 6 presents the same data as Table 5, but on a percentage basis. Data is presented on a percentage basis to facilitate comparisons among the individual state contributions by individual tier and on an aggregate basis. Among the Tier 1 resources, Virginia provided nearly 40 percent of the RECs retired in 2008; Michigan, nearly 20 percent; New York, nearly 14 percent, and Ohio, 13.5 percent. Maryland provided just over 5 percent of the RECs retired in 2008, while few Tier 1 RECs were provided by the remaining states. For the Tier 2 resources, Pennsylvania provided nearly 58 percent of the RECs, followed by Maryland (13.8 percent), New York (13. 4 percent), and Virginia (8.0 percent). On a percentage basis, single digit REC amounts or no RECs were provided by the remaining states for RPS compliance.

**Table 6: 2008 Compliance Reports' REC Retirement by State** (%)

| State | Tier 1 | Tier 2 | Total |
|---|---|---|---|
| **PA** | 1.4% | 57.6% | 31.6% |
| **VA** | 39.6% | 8.0% | 22.6% |
| **NY** | 13.8% | 13.4% | 13.6% |
| **MD** | 5.3% | 13.8% | 9.9% |
| **MI** | 19.6% | 0.0% | 9.1% |
| **OH** | 13.5% | 0.0% | 6.2% |
| **WV** | 1.2% | 3.8% | 2.6% |
| **NJ** | 0.0% | 3.5% | 1.9% |
| **IL** | 2.6% | 0.0% | 1.2% |
| **DE** | 2.3% | 0.0% | 1.1% |
| **NC** | 0.6% | 0.0% | 0.3% |
| **TOTAL** | **100.0%** | **100.0%** | **100.0%** |

Additional information pertaining to the source of renewable energy used to meet Maryland's 2008 RPS compliance requirements is in Appendices B and C. Appendix B provides the renewable resources used by retail suppliers on a Tier and State basis. Appendix C provides a summary of the renewable energy facilities in and outside of the State that generated RECs, which were retired in 2008 for the Maryland RPS. Appendix C also presents the number of facilities by state, tier, and type of renewable facility.

## III. MARYLAND RENEWABLE ENERGY FACILITIES

Maryland's RPS requires electric suppliers to obtain a minimum percentage of their power from renewable energy resources. Implementation of the Maryland RPS program can provide an incentive for renewable generators to locate in Maryland and generate electricity. The renewable requirement establishes a market for renewable energy, and to the extent Maryland's geography and natural resources can be utilized to generate renewable electricity, power plant developers may locate projects within the State. Moreover, Maryland's RPS requires suppliers that do not meet the annual obligations to pay penalties, which in turn are used to support the creation of new Tier 1 renewable sources in the State. Additionally, on or before December 31, 2011, Tier-1 solar resources that are not located in the State are eligible only to the extent sufficient offers from instate resources are not made. This section of the report provides information on the renewable energy facilities located in Maryland in 2008.[32,33] Renewable energy generated in Maryland can be used in other states for RPS compliance purposes, and also can be sold in support of competitive retail electricity supplier product offerings (*i.e.*, green power products).[34] Green power products are offered to the public with higher concentrations of renewable energy than required via state RPS requirements. Additional analysis pertaining to the Maryland-based renewable generators is presented below and in Appendix D.

In 2008, over 217,000 Tier 1 RECs and nearly 2,557,000 Tier 2 RECs were generated in Maryland, totaling over 2,774,000 RECs (see Table 7). Black liquor comprised nearly a 70 percent share of the Tier 1 RECs generated in Maryland; small hydro, 15.2 percent; landfill gas, 15.0 percent; and solar, 0.1 percent. Tier 2 in-state RECs were hydro facilities with a 72.1 percent share, and municipal solid waste, 27.9 percent.

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32 PUC Article §7-704(a)(2)(i)(2)

33 Specific information pertaining to the State's renewable energy facilities and described herein was made available by PJM-EIS, in response to Commission Staff's request. PJM-EIS has subsequently determined that the requested information will be made available on an ongoing basis as a GATS State Agency Report.

34 Facilities located in Maryland are not necessarily registered by the Maryland PSC for the Maryland RPS; rather, certain facilities may seek certification out-of-state in support of a long-term contract for the RECs from an out-of-state counterparty. Counterparties can include an electricity supplier operating in a different state and purchasing the RECs to satisfy the RPS requirement for another state or other entities, such as brokers that purchase the REC output for resale. PJM-EIS reports that as of year end 2009, there are 273 registered renewable generators located in Maryland. Of the 273 generators, 257 are approved by the PSC for Maryland RPS compliance. The 16 facilities registered for use in other states include 11 solar PV or solar thermal facilities registered in the District of Columbia, and the remaining five are landfill gas generators registered in Delaware, New Jersey, and Pennsylvania.

**Table 7: 2008 Maryland Generated RECs by Fuel Source**

| Tier 1 | | | | | Tier 2 | | | Tier 1 & 2 Total |
|---|---|---|---|---|---|---|---|---|
| BLQ | WAT | LFG | Solar | *Total* | WAT | MSW | *Total* | |
| 151,297 | 33,015 | 32,534 | 276 | 217,122 | 1,843,962 | 713,035 | 2,556,997 | 2,774,119 |
| 69.7% | 15.2% | 15.0% | 0.1% | 100.0% | 72.1% | 27.9% | 100.0% | |

Fuel Source Abbreviations: BLQ, Black Liquor; LFG, Landfill Gas; MSW, Municipal Solid Waste; OBL, Other Biomass Liquids; SUN, Solar; WAT, Hydroelectric; WDS, Wood and Waste Solids; and WND, Wind.

Source: PJM-EIS, Maryland PSC data requests, 11/5/2009 and 1/13/2010.

Table 8 presents additional detail regarding the disposition of 2008 Maryland-generated RECs through calendar year 2008. Nearly two-thirds (64.5 percent) of the RECs generated within the State of Maryland by independent electric generators were unsold and consequently banked for potential sale in Maryland or other states in subsequent compliance years.[35] Nearly a third (28.9 percent) of the RECs generated in Maryland were retired to meet the RPS requirements in various states. Maryland 2008 vintage RECs (6.6 percent) were also sold to support voluntary market products (*e.g.*, green energy). Labeled as "Other" in Table 8, a small minority of RECs were posted for sales or awaiting confirmation by counterparties to complete year-end transactions (0.2 percent).

**Table 8: Disposition of 2008 Maryland Generated RECs**

| | Banked | 2008 RPS Compliance | Sold - Voluntary Markets | Other | Total |
|---|---|---|---|---|---|
| **Tier 1** | 196,098 | 18,271 | 2,477 | 0 | 216,846 |
| **Tier 1 Solar** | 48 | 227 | 0 | 1 | 276 |
| **Tier 2** | 1,593,026 | 776,304 | 181,381 | 6,286 | 2,556,997 |
| **Total** | 1,789,172 | 794,802 | 183,858 | 6,287 | 2,774,119 |
| **(%)** | 64.5% | 28.9% | 6.6% | 0.2% | 100.0% |

Source: PJM-EIS, Maryland PSC data requests, 11/5/2009 and 1/13/2010.

Table 9 presents on a state-by-state basis, the distribution of the RECs generated in the State of Maryland that were then extinguished (*i.e.*, retired) for 2008 compliance purposes. In 2008, Maryland-generated RECs were used in six jurisdictions: Delaware, Illinois, Maryland, New Jersey, Pennsylvania, and the District of Columbia. For 2008 Maryland Tier 1 RECs, New

[35] In part, banking provides an opportunity for generators and electric suppliers to locate one another and establish relationships in the newly established renewable marketplace. The renewable marketplace is a regional marketplace. With the trend of individual states first enacting legislation to support renewables (*e.g.*, RPS requirements), and then increasing the percentage requirements and raising penalties for shortfalls, banking provides market participants with the opportunity to employ regional strategies (*i.e.*, maximize revenues, minimize compliance costs). Banking also provides an opportunity to support new product offerings outside of the RPS requirements, that is, green energy retail products that retail customers purchase, typically at a price premium, with significant concentrations of renewable energy (*e.g.*, 100 percent wind).

Jersey used 82.7 percent of the generated RECs; Delaware, 16.1 percent, and Maryland, 1.2 percent. The Maryland resources retired in-State for compliance purposes were limited to Solar RECs. Negligible procurement of Tier 1 Maryland RECs generated in 2008 supported Pennsylvania and the District of Columbia RPS programs.

**Table 9: Retired 2008 Maryland Generated RECs by State**

| Fuel & Tier | DC | DE | IL | MD | NJ | PA | TOTAL |
|---|---|---|---|---|---|---|---|
| BLQ | - | - | - | - | - | - | - |
| SUN | - | - | - | 227 | - | - | 227 |
| LFG | - | 2,974 | - | - | 2,292 | - | 5,266 |
| WAT | - | - | - | - | 13,000 | 5 | 13,005 |
| **Tier 1 Total** | - | 2,974 | - | 227 | 15,292 | 5 | 18,498 |
| ***Percentage*** | *0.0%* | *16.1%* | *0.0%* | *1.2%* | *82.7%* | *0.0%* | *100.0%* |
| MSW | 25,682 | - | - | 4,971 | 538,370 | 19,200 | 588,223 |
| WAT | - | - | 110,940 | 76,986 | - | 155 | 188,081 |
| **Tier 2 Total** | 25,682 | - | 110,940 | 81,957 | 538,370 | 19,355 | 776,304 |
| ***Percentage*** | *3.3%* | *0.0%* | *14.3%* | *10.6%* | *69.4%* | *2.5%* | *100.0%* |
| **TOTAL** | 25,682 | 2,974 | 110,940 | 82,184 | 553,662 | 19,360 | 794,802 |
| ***Percentage*** | *3.2%* | *0.4%* | *14.0%* | *10.3%* | *69.7%* | *2.4%* | *100.0%* |

Fuel Source Abbreviations: BLQ, Black Liquor; LFG, Landfill Gas; MSW, Municipal Solid Waste; OBL, Other Biomass Liquids; SUN, Solar; WAT, Hydroelectric; WDS, Wood and Waste Solids; and WND, Wind.

Source: PJM-EIS, Maryland PSC data requests, 11/5/2009 and 1/13/2010.

## IV. CONCLUSION

The Maryland RPS Program is designed to create a stable and predictable market for energy generated from renewables, and to foster additional development and growth in the renewable industry. Implementation of the RPS Program assists in overcoming market barriers seen as impediments for the development of the industry; moreover, increasing reliance upon renewable energy technologies to satisfy electric power requirements can provide benefits including reductions in emissions of pollutants, increases in fuel diversity, and economic and employment benefits to the State.

The electric supplier compliance reports of 2008, verified by Commission Staff, indicate that the State of Maryland RPS obligations were satisfied through submission of the appropriate level of Tier 1 and Tier 2 RECs or via alternative compliance payments. Market participants use a strategy that identifies and incorporates the use of the least-cost, predominant renewable technologies to meet the State's tiered requirements. For the 2008 RPS requirements, suppliers used substantial amounts of qualifying biomass (*e.g.*, waste wood and the mill residue known as black liquor), as well as methane from the anaerobic decomposition of organic materials in landfills. Small hydroelectric resources were also procured in substantial amounts by electric suppliers. A limited amount of wind energy was procured.

Three Mid-Atlantic states provided nearly two-thirds (64.1 percent) of the Tier 1 and Tier 2 RECs retired by Maryland electric suppliers in 2008: Pennsylvania was the largest provider of Tier 2 RECs, Virginia the largest provider of Tier 1 RECs. As well, Maryland resources in the aggregate provided slightly less than ten percent of the RECs for Maryland's tiered RPS requirements. In 2008, robust levels of Tier 2 resources were available in the State for potential use by electric suppliers for RPS compliance. Tier 1 and Tier 1 solar RPS obligations require electric suppliers to contract with in-State and out-of-state resources, and pay compliance fees for shortages. For the initial year of the State's Tier 1 solar requirement, compliance fees were the predominate method used by electric suppliers.

Maryland renewable energy facilities can register in multiple states to meet and comply with various policy objectives – and sell additional RECs that support clean, green, or renewable products offered by retail suppliers. In Maryland, only a small portion of the renewable output and associated RECs generated during calendar year 2008 were retired for RPS compliance purposes; nearly two-thirds (64.5 percent) of the RECs were banked for sale in future years.

In 2008, Maryland enacted several changes to the Maryland Renewable Energy Portfolio Standard to increase the contribution of renewable energy to electricity supply: the RPS percentage requirements were accelerated and the geographic scope in which renewable resources can be obtained for compliance restricted. The effect is an increase in demand while reducing supply, thereby providing upward price pressure for RECs. Moreover, an increase in the Tier 1 compliance fees will take effect in 2011 to assist in fostering additional development and growth in the industry. Maryland's adoption of a Tier 1 solar requirement in 2008, in addition to Tier 1 and Tier 2 requirements, will support development of a wider variety of technologies as a result of RPS implementation. Initial year implementation and timing of the solar requirement resulted in significant payments into the SEIF to support in-state Tier 1 resource development.

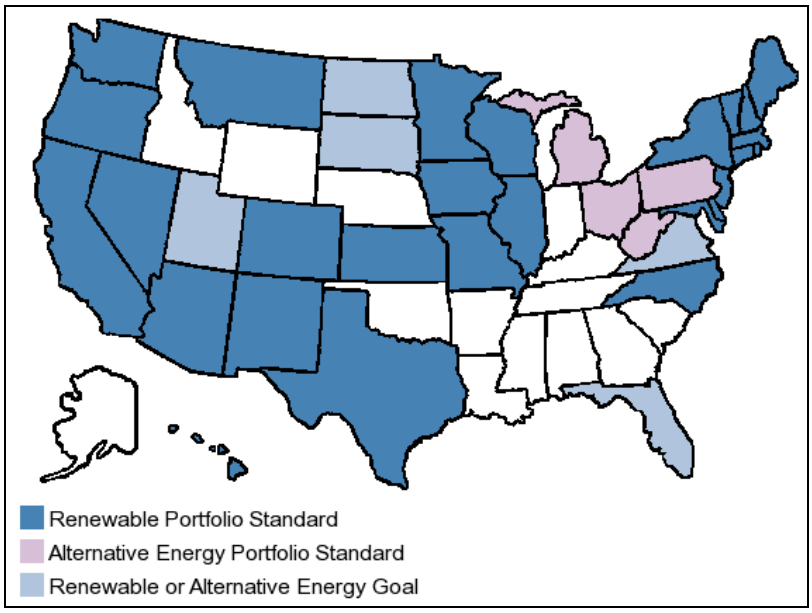
The Commission will continue to review applications from facilities requesting certification as a Maryland renewable energy facility, oversee the Renewable Portfolio Standard Program, and verify that the suppliers providing electricity products in the State of Maryland procure adequate renewable resources. As RPS program results are received and reviewed, further refinements to the program may be made to ensure that the objectives of the Maryland RPS Program are met.

# APPENDICES

## Appendix A: Summary of State Renewable Portfolio Standards

To facilitate and promote the use of renewable energy, the RPS was enacted as a state policy that required electricity providers to obtain a minimum percentage of their power from renewable energy resources by a specific date. Currently, more than 30 states including Maryland have RPS policies in place in an effort to promote clean energy and reduce greenhouse gas emissions in the nation.

### Renewable and Alternative Energy Portfolio Standards in the U.S.




*(Source: www.pewclimate.org)*

This table presents a summary of state renewable portfolio standards with links to organizations that are administering these standards and for further reference. Percentages refer to a portion of electricity sales and megawatts (MW) to absolute capacity requirements. Most of these standards are phased in over multiple years, and the Year on the table refers to when the full requirement takes effect.

| State | Amount | Year | Organization Administering RPS |
|---|---|---|---|
| **Arizona** | 15% | 2025 | Arizona Corporation Commission |
| **California** | 33% | 2030 | California Energy Commission |
| **Colorado** | 20% | 2020 | Colorado Public Utilities Commission |
| **Connecticut** | 23% | 2020 | Department of Public Utility Control |
| **District of Columbia** | 20% | 2020 | DC Public Service Commission |
| **Delaware** | 20% | 2019 | Delaware Energy Office |

## Appendix A: Summary of State Renewable Portfolio Standards (Cont'd)

| State | Amount | Year | Organization Administering RPS |
|---|---|---|---|
| **Hawaii** | 20% | 2020 | Hawaii Strategic Industries Division |
| **Iowa** | 105 MW | | Iowa Utilities Board |
| **Illinois** | 25% | 2025 | Illinois Department of Commerce |
| **Massachusetts** | 15% | 2020 | Massachusetts Division of Energy Resources |
| **Maryland** | 20% | 2022 | Maryland Public Service Commission |
| **Maine** | 40% | 2017 | Maine Public Utilities Commission |
| **Michigan** | 10% | 2015 | Michigan Public Service Commission |
| **Minnesota** | 25% | 2025 | Minnesota Department of Commerce |
| **Missouri** | 15% | 2021 | Missouri Public Service Commission |
| **Montana** | 15% | 2015 | Montana Public Service Commission |
| **New Hampshire** | 23.8% | 2025 | New Hampshire Office of Energy and Planning |
| **New Jersey** | 22.5% | 2021 | New Jersey Board of Public Utilities |
| **New Mexico** | 20% | 2020 | New Mexico Public Regulation Commission |
| **Nevada** | 20% | 2015 | Public Utilities Commission of Nevada |
| **New York** | 24% | 2013 | New York Public Service Commission |
| **North Carolina** | 12.5% | 2021 | North Carolina Utilities Commission |
| **North Dakota*** | 10% | 2015 | North Dakota Public Service Commission |
| **Oregon** | 25% | 2025 | Oregon Energy Office |
| **Pennsylvania** | 8% | 2020 | Pennsylvania Public Utility Commission |
| **Rhode Island** | 16% | 2019 | Rhode Island Public Utilities Commission |
| **South Dakota*** | 10% | 2015 | South Dakota Public Utility Commission |
| **Texas** | 5,880 MW | 2015 | Public Utility Commission of Texas |
| **Utah*** | 20% | 2025 | Utah Department of Environmental Quality |
| **Vermont*** | 10% | 2013 | Vermont Department of Public Service |
| **Virginia*** | 12% | 2022 | Virginia Department of Mines, Minerals, and Energy |
| **Washington** | 15% | 2020 | Washington Secretary of State |
| **Wisconsin** | 10% | 2015 | Public Service Commission of Wisconsin |

*Five states, ND, SD, UT, VA, and VT, have set voluntary goals for adopting renewable energy instead of portfolio standards with binding targets.

*(Source: http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm)*

# Appendix B: 2008 Compliance Reports – Retired RECs by Tier & Resource

## Tier 1*

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 1 |
|---|---|---|---|---|---|---|
| 1 | PH Glatfelter | OH | BLQ | 162,215 | 34.72% | 13.06% |
| 2 | Covington | VA | BLQ | 111,015 | 23.76% | 8.94% |
| 3 | Luke Mill | MD | BLQ | 58,145 | 12.44% | 4.68% |
| 4 | Hopewell Mill | VA | BLQ | 51,952 | 11.12% | 4.18% |
| 5 | Escabana | MI | BLQ | 43,000 | 9.20% | 3.46% |
| 6 | Franklin Mill | VA | BLQ | 40,921 | 8.76% | 3.30% |
| | | | **Total** | **467,248** | **100.00%** | **37.63%** |

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 1 |
|---|---|---|---|---|---|---|
| 7 | Arbor Hills | MI | LFG | 101,681 | 55.14% | 8.19% |
| 8 | Edge Moor | DE | LFG | 29,165 | 15.81% | 2.35% |
| 9 | Mallard Lake | IL | LFG | 21,864 | 11.86% | 1.76% |
| 10 | Lyon Dev | MI | LFG | 9,070 | 4.92% | 0.73% |
| 11 | C&C Electric | MI | LFG | 7,552 | 4.10% | 0.61% |
| 12 | Richmond Electric | VA | LFG | 6,642 | 3.60% | 0.53% |
| 13 | Charlotte Motor Speedway | NC | LFG | 2,650 | 1.44% | 0.21% |
| 14 | Rockford Electric | IL | LFG | 2,096 | 1.14% | 0.17% |
| 15 | I-95 Landfill | VA | LFG | 1,593 | 0.86% | 0.13% |
| 16 | Quad Cities | IL | LFG | 1,593 | 0.86% | 0.13% |
| 17 | South Barrington Electric | IL | LFG | 510 | 0.28% | 0.04% |
| | | | **Total** | **184,416** | **100.00%** | **14.85%** |

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 1 |
|---|---|---|---|---|---|---|
| 18 | Trenton | NY | WAT-1 | 121,474 | 57.33% | 9.78% |
| 19 | Inghams | NY | WAT-1 | 33,436 | 15.78% | 2.69% |
| 20 | Prospect | NY | WAT-1 | 16,398 | 7.74% | 1.32% |
| 21 | AP Misc | WV | WAT-1 | 15,378 | 7.26% | 1.24% |
| 22 | Piney | PA | WAT-1 | 12,217 | 5.77% | 0.98% |
| 23 | Deep Creek | MD | WAT-1 | 7,898 | 3.73% | 0.64% |
| 24 | Conemaugh | PA | WAT-1 | 5,070 | 2.39% | 0.41% |
| | | | **Total** | **211,871** | **100.00%** | **17.06%** |

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 1 |
|---|---|---|---|---|---|---|
| 25 | Multitrade of Pittsylvania | VA | WDS | 257,213 | 69.17% | 20.72% |
| 26 | Cadillac RE | MI | WDS | 75,328 | 20.26% | 6.07% |
| 27 | Hopewell Mill | VA | WDS | 15,648 | 4.21% | 1.26% |
| 28 | Covington Mill | VA | WDS | 6,907 | 1.86% | 0.56% |
| 29 | Hillman | MI | WDS | 6,686 | 1.80% | 0.54% |
| 30 | Coshocton Mill | OH | WDS | 5,300 | 1.43% | 0.43% |
| 31 | VP Cravenwood | NC | WDS | 4,756 | 1.28% | 0.38% |
| | | | **Total** | **371,838** | 100.00% | **29.95%** |

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 1 |
|---|---|---|---|---|---|---|
| 32 | Mendota Hills LLC | IL | WND | **6,242** | **100.00%** | **0.50%** |

## Tier 2

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 2 |
|---|---|---|---|---|---|---|
| 1 | SPSA WTE | VA | MSW | 115,459 | 54.53% | 8.00% |
| 2 | Union County | NJ | MSW | 50,001 | 23.61% | 3.46% |
| 3 | Mongomery County | MD | MSW | 31,428 | 14.84% | 2.18% |
| 4 | Montenay Montgomery | PA | MSW | 14,858 | 7.02% | 1.03% |
| | | | **Total** | **211,746** | **100.00%** | **14.66%** |

| | Facility Name | State | Resource | Quantity | Resource % | % of Tier 2 |
|---|---|---|---|---|---|---|
| 5 | Safe Harbor | PA | WAT-2 | 816,566 | 66.26% | 56.55% |
| 6 | Conowingo | MD | WAT-2 | 168,044 | 13.64% | 11.64% |
| 7 | Sherman Island | NY | WAT-2 | 138,500 | 11.24% | 9.59% |
| 8 | School Street | NY | WAT-2 | 54,429 | 4.42% | 3.77% |
| 9 | AEP Summerville | WV | WAT-2 | 35,557 | 2.89% | 2.46% |
| 10 | Lake Lynn | WV | WAT-2 | 19,203 | 1.56% | 1.33% |
| | | | **Total** | **1,232,299** | **100.00%** | **85.34%** |

| | |
|---|---|
| **Tier 1 REC Total** | **1,241,615** |
| **SREC Total** | **227** |
| **Tier 2 REC Total** | **1,444,045** |
| **Grand Total**** | **2,685,887** |

| **Resource Definitions** | |
|---|---|
| Black Liquor | BLQ |
| Landfill Gas | LFG |
| Municipal Solid Waste | MSW |
| Hydroelectric | WAT |
| Wood/Waste Solids | WDS |
| Wind | WND |
| Solar | SUN |

*Solar facilities are not represented in this table. In 2008, 70 facilities located in Maryland, produced a total of 227 SRECs.

**REC totals reflect RECs retired in GATS in 2008, but differ slightly from what LSEs reported for RPS compliance. More RECs were retired in GATS than were used for compliance.

## Appendix C: 2008 Compliance Reports – Facilities Generating Retired RECs by State & Resource

| | DE | IL | MD | MI | NC | NJ | NY | OH | PA | VA | WV | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Tier 1*** | | | | | | | | | | | | |
| Black Liquor | | | 1 | 1 | | | | 1 | | 3 | | **6** |
| Land Fill Gas | 1 | 4 | | 3 | 1 | | | | | 2 | | **13** |
| Solar | | | 70 | | | | | | | | | **70** |
| Small Hydro | | | 1 | | | | 3 | | 2 | | 1 | **7** |
| Waste Wood | | | | 2 | 1 | | | 1 | | 3 | | **7** |
| Wind | | 1 | | | | | | | | | | **1** |
| ***Tier 2*** | | | | | | | | | | | | |
| Municipal Waste | | | 1 | | | 1 | | | 1 | 1 | | **4** |
| Large Hydro | | | 1 | | | | 2 | | 1 | | 2 | **6** |
| **Total*** | **1** | **5** | **74** | **6** | **2** | **1** | **5** | **2** | **4** | **9** | **3** | **112** |

* Information is based upon certified renewable energy facilities which offered RECs retired in GATS for the 2008 compliance year. Two facilities in Virginia, the Covington Facility and Hopewell Mill, were double counted since each facility has a Commission issued certification number and produces RECs from both black liquor and wood waste. Therefore, 110 facilities produced RECs for the 2008 RPS compliance year.

## Appendix D: Distribution of 2008 Vintage RECs Generated in Maryland

| Fuel Type & Tier | RECs Retired by State | | | | | | Banked | Sold - Voluntary Markets | Pending Transfer | Bulletin Board | Exported | RECs Generated in 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NJ | IL | MD | DC | PA | DE | | | | | | |
| SUN | | | 227 | | | | 48 | | | 1 | | 276 |
| BLQ | | | | | | | 151,297 | | | | | 151,297 |
| LFG | 2,292 | | | | | 2,974 | 27,268 | | | | | 32,534 |
| WAT | 13,000 | | | | 5 | | 17,533 | 2,477 | | | | 33,015 |
| **Tier 1 Total** | **15,292** | **0** | **0** | **0** | **5** | **2,974** | **196,098** | **2,477** | **0** | **0** | **0** | **216,846** |
| MSW | 538,370 | | 4,971 | 25,682 | 19,200 | | 124,672 | 140 | | | | 713,035 |
| WAT | | 110,940 | 76,986 | | 155 | | 1,468,354 | 181,241 | 6,286 | | | 1,843,962 |
| **Tier 2 Total** | **538,370** | **110,940** | **81,957** | **25,682** | **19,355** | **0** | **1,593,026** | **181,381** | **6,286** | | **0** | **2,556,997** |
| **Total** | **553,662** | **110,940** | **82,184** | **25,682** | **19,360** | **2,974** | **1,789,172** | **183,858** | **6,286** | **1** | **0** | **2,774,119** |

Source: PJM-EIS, Maryland PSC data requests, 11/5/2009 and 1/13/2010.

## Appendix E: Maryland Certified Renewable Energy Facilities

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| 217 International Circle Bunting, LLC | MD | 0.04095 | SUN |
| 6011Bradley | MD | 0.00374 | SUN |
| ACE CUMBERLAND CTY 1 LF | NJ | 4.8 | LFG |
| AEP FOWLER RIDGE 1A WF | IN | 200 | WND |
| AEP FOWLER RIDGE 1B WF | IN | 100 | WND |
| AEP FRIES HYDRO | VA | 5 | WAT |
| AEP SUMMERVILLE 1-2 H | WV | 80 | WAT |
| Airy Hill Farms | MD | 0.004 | SUN |
| Airy Hill Farms | MD | 0.004 | SUN |
| Albrecht Residence | MD | 0.00368 | SUN |
| Allegheny 5 | PA | 7.1 | WAT |
| Allegheny Lock& Dam No 6 Hydro Project | PA | 8.9 | WAT |
| Angiola | MD | 0.005 | SUN |
| Ann Marie Magenta | MD | 0.0042 | SUN |
| AP ARDEN 1 LF | PA | 6.4 | LFG |
| AP GREENLAND GAP 1 WF | WV | 264 | WND |
| AP MISC HYDRO H | WV | 6 | WAT |
| Arbor Hills | MI | 25 | LFG |
| Archbald Power Station | PA | 23 | LFG |
| Ardanuy | MD | 0.00405 | SUN |
| Arnheim Residence | MD | 0.005 | SUN |
| Astrom Solar Residence | MD | 0.003 | SUN |
| Avijan | MD | 0.003 | SUN |
| Barry Levine | MD | 0.0028 | SUN |
| Bass Residence | MD | 0.01 | SUN |
| Beecher | IL | 3.171 | LFG |
| Ben Wright | MD | 0.0015 | SUN |
| Bensley Residence | MD | 0.002 | SUN |
| Berman | MD | 0.002 | SUN |
| Big Shoals Hydro | VA | 0.5 | WAT |
| Bjork | MD | 0.002 | SUN |
| Blankman Residence | MD | 0.00102 | SUN |
| Blewett | NC | 22 | WAT |
| Bohdal Solar 1 | MD | 0.0032 | SUN |
| Bolger Residence | MD | 0.00095 | SUN |
| Boonsboro Pharmacy | MD | 0.012 | SUN |
| Boonsboro Pharmacy #2 | MD | 0.01 | SUN |
| Brennecke - Solar 1 | MD | 0.0126 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Bristol | MD | 0.001 | SUN |
| Broadley Residence | MD | 0.006 | SUN |
| Brown | MD | 0.0035 | SUN |
| Bruce and Kathy Hendrickson | MD | 0.0046 | SUN |
| Bryan-Taff | MD | 0.003 | SUN |
| Burgess | MD | 0.01075 | SUN |
| BWWTP Co-Gen Plant | MD | 3 | LFG |
| C&C Electric | MI | 3 | LFG |
| Cadillac Renewable Energy | MI | 40 | WDS |
| Capitol City | MD | 0.004 | SUN |
| Cardin Solar Residence | MD | 0.00321 | SUN |
| Carter | MD | 0.002 | SUN |
| Century 1 WF | IA | 185 | WND |
| Charlotte Motor Speedway | NC | 5.3 | LFG |
| Chase Residence | MD | 0.00299 | SUN |
| Chestnut Ridge | TN | 3.2 | LFG |
| Chin | MD | 0.004 | SUN |
| Chisholm | MD | 0.00405 | SUN |
| Chitnis | MD | 0.002 | SUN |
| CID | IL | 6.2 | LFG |
| Clayton-Alexander | MD | 0.003 | SUN |
| Coleman Falls Hydro | VA | 0.5 | WAT |
| Collins Residence | MD | 0.004 | SUN |
| COM HIGH TRAIL 1 WIND | IL | 198 | WND |
| COM OLD TRAIL WF 2 | IL | 198 | WND |
| Conemaugh Hydro Plant | PA | 16.5 | WAT |
| Conowingo | MD | 474 | WAT |
| Coshocton Mill | OH | 16.5 | WDS |
| Coster | MD | 0.002 | SUN |
| Covanta New Martinsville Energy | WV | 34 | WAT |
| Covington Facility | VA | 96.5 | BLQ & WDS |
| Crawford System | MD | 0.005 | SUN |
| Cupps | MD | 0.004 | SUN |
| Czarnowski | MD | 0.002 | SUN |
| Dale Delahay | MD | 0.002 | SUN |
| Damanhuri | MD | 0.00264 | SUN |
| D'Arcy Residence | MD | 0.001 | SUN |
| David J. Gochenaur | MD | 0.068 | SUN |
| Davio Residence | MD | 0.00322 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Dawley | MD | 0.004 | SUN |
| Dayton Hydro Facility | IL | 3.6 | WAT |
| Deep Creek | MD | 32.66 | WAT |
| Des Plaines | IL | 3.5 | LFG |
| DeSilva residence | MD | 0.0017 | SUN |
| Dowd Residence | MD | 0.00432 | SUN |
| DPL CENTRAL 1 LF | DE | 3 | LFG |
| DPL SOUTHERN LF1 | DE | 4 | LFG |
| Drenning | MD | 0.005 | SUN |
| Dribben Residence | MD | 0.00288 | SUN |
| Dubrosky Residence | MD | 0.0054 | SUN |
| Duncan | MD | 0.001 | SUN |
| Easton | MD | 69 | OBL |
| Eckel Residence | MD | 0.00216 | SUN |
| Ed Blacka | MD | 0.00552 | SUN |
| Edge Moor | DE | 75 | LFG |
| Edge Moor | DE | 177 | LFG |
| Edge Moor | DE | 446 | LFG |
| Ellen/Boscov Residence | MD | 0.004 | SUN |
| Epley | MD | 0.003 | SUN |
| Escanaba Paper Co. | MI | 103 | BLQ & WDS |
| Fairless Hills | PA | 30 | LFG |
| Fairless Hills | PA | 30 | LFG |
| Feighner Residence | MD | 0.00945 | SUN |
| Ferguson Residence | MD | 0.00306 | SUN |
| Fighera Solar | MD | 0.0027 | SUN |
| Finn | MD | 0.005 | SUN |
| Finn Residence | MD | 0.0038 | SUN |
| Finnerty | MD | 0.00315 | SUN |
| Frank Residence | MD | 0.0014 | SUN |
| Franklin Mill | VA | 25 | BLQ |
| FRANKLIN MILL | VA | 15.625 | BLQ |
| FRANKLIN MILL | VA | 32.4 | BLQ |
| Fred Gasper | MD | 0.003 | SUN |
| Fuller | MD | 0.005 | SUN |
| GABLER | MD | 0.004 | SUN |
| Gagliardi_Cheverly | MD | 0.00954 | SUN |
| Gall | MD | 0.002 | SUN |
| Garnett Residence | MD | 0.004 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Gary Clarke | MD | 0.00668 | SUN |
| Gesswein | MD | 0.005 | SUN |
| Gibson Residence | MD | 0.00315 | SUN |
| gigante | MD | 0.002 | SUN |
| Gilbert Wright | MD | 0.00483 | SUN |
| Glazer | MD | 0.00414 | SUN |
| Gogtay | MD | 0.0036 | SUN |
| Goldberg | MD | 0.003 | SUN |
| Good | MD | 0.003 | SUN |
| Goor | MD | 0.005 | SUN |
| Grabow Residence | MD | 0.00416 | SUN |
| Greene Valley | IL | 9.3 | LFG |
| Greg Thornwall | MD | 0.0031 | SUN |
| Grill | MD | 0.005 | SUN |
| Gruner | MD | 0.002 | SUN |
| Gunn | MD | 0.003 | SUN |
| Gurevich Solar | MD | 0.0099 | SUN |
| Haas Home System | MD | 0.0048 | SUN |
| Haas Solar | MD | 0.006 | SUN |
| Hamilton Solar | MD | 0.00684 | Sun |
| Hansen | MD | 0.004 | SUN |
| Harvey | MD | 0.0081 | SUN |
| Hauck | MD | 0.002 | SUN |
| Heimer | MD | 0.005 | SUN |
| Heimer 2 | MD | 0.00252 | SUN |
| Herman | MD | 0.0027 | SUN |
| Highland | MD | 0.003 | SUN |
| Hilditch | MD | 0.003 | SUN |
| Hillman Power Co. | MI | 20 | WDS |
| Hinton | MD | 0.002 | SUN |
| Hoffman Residence | MD | 0.004 | SUN |
| Hogenson | MD | 0.00405 | SUN |
| Holcomb Rock Hydro | VA | 0.6 | WAT |
| Holder, Justin | MD | 0.0098 | SUN |
| Holder, Justin II | MD | 0.0099 | SUN |
| Hopewell Mill | VA | 47.6 | BLQ & WDS |
| Hopkins Residence | MD | 0.0052 | SUN |
| Horton | MD | 0.003 | SUN |
| Hudson | MD | 0.002 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| I-95 Landfill Phase I | VA | 0.8 | LFG |
| I-95 Landfill Phase II | VA | 0.8 | LFG |
| I-95 Landfill Phase II | VA | 0.8 | LFG |
| I-95 Landfill Phase II | VA | 0.8 | LFG |
| I-95 Landfill Phase II | VA | 0.8 | LFG |
| I-95 Landfill Phase1 | VA | 0.8 | LFG |
| I-95 Landfill Phase1 | VA | 0.8 | LFG |
| I-95 Landfill Phase1 | VA | 0.8 | LFG |
| Inghams | NY | 6.8 | WAT |
| Isenstadt Solar | MD | 0.004 | SUN |
| Jacobs Solar | MD | 0.0021 | SUN |
| James Parreco & Son, Inc. | MD | 0.009 | SUN |
| JAMESESTAFFORD | MD | 0.00705 | SUN |
| Jamison | MD | 0.005 | SUN |
| Jenkins Roof | MD | 0.0036 | SUN |
| Jha Residence | MD | 0.0036 | SUN |
| John Spears Solar | MD | 0.00315 | SUN |
| Johnson | MD | 0.00405 | SUN |
| Kaminski | MD | 0.005 | SUN |
| Kankakee | IL | 1.8 | LFG |
| KC-MES JV | MD | 0.255 | SUN |
| Keim | MD | 0.005 | SUN |
| Kempf | MD | 0.0069 | SUN |
| Kent Island Kindel Generation | MD | 0.0045 | SUN |
| Kessel home | MD | 0.001 | SUN |
| Kessel home | MD | 0.0045 | SUN |
| Klinken Residence | MD | 0.00731 | SUN |
| Klontz | MD | 0.001 | SUN |
| Kovalskaia residence | MD | 0.00526 | SUN |
| Krasnopoler PV | MD | 0.00468 | SUN |
| Krute | MD | 0.002 | SUN |
| Lake Gas Recovery | IL | 9.3 | LFG |
| Lake Lynn Power Station | WV | 51.2 | WAT |
| Lakeview Gas Recovery | PA | 6.1 | LFG |
| Larney | MD | 0.002 | SUN |
| Larry Lauver | MD | 0.0036 | SUN |
| Lawrence | MD | 0.003 | SUN |
| Lennox Residence | MD | 0.001 | SUN |
| Levin | MD | 0.00495 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Lieberman | MD | 0.005 | SUN |
| Lucci Residence | MD | 0.00405 | SUN |
| Luke Mill | MD | 65 | BLQ |
| Lyon Development | MI | 5 | LFG |
| Lyon Residence | MD | 0.0041 | SUN |
| Machuga Solar | MD | 0.0054 | SUN |
| Mack Residence | MD | 0.00165 | SUN |
| Maggie's Music | MD | 0.004 | SUN |
| Mallard Lake Electric | IL | 25 | LFG |
| Manley | MD | 0.004 | SUN |
| Marc Gagnier | MD | 0.00472 | SUN |
| Marshall | NC | 5 | WAT |
| Mary C. Bunting | MD | 0.004 | SUN |
| Masterman Residence | MD | 0.00525 | SUN |
| McConnell | MD | 0.003 | SUN |
| McCormick HVPDC Building | MD | 0.5 | SUN |
| McCormick Spice Milling Plant | MD | 0.375 | SUN |
| McCullough | MD | 0.00405 | SUN |
| MCPS - Clarksburg HS | MD | 0.277 | SUN |
| MCPS - College Gardens ES | MD | 0.076 | SUN |
| MCPS - Lakelands Park MS | MD | 0.11 | SUN |
| MCPS - Richard Montgomery | MD | 0.108 | SUN |
| MD-70145-SUN-01 | MD | 0.0035 | SUN |
| MD-70146-SUN-01 | MD | 0.0035 | SUN |
| MD-70147-SUN-01 | MD | 0.0063 | SUN |
| MD-70148-SUN-01 | MD | 0.0063 | SUN |
| MD-70149-SUN-01 | MD | 0.00756 | SUN |
| MD-70150-SUN-01 | MD | 0.00525 | SUN |
| Meiselman | MD | 0.004 | SUN |
| Mendota Hills LLC | IL | 50 | WND |
| Meyersdale Windpower | PA | 30 | WND |
| Middlesex Generating Facility | NJ | 22.25 | LFG |
| Mitchell Residence | MD | 0.00324 | SUN |
| Monmouth Landfill Gas to Energy | NJ | 7.4 | LFG |
| Monmouth Landfill Gas To Energy BTM | NJ | 3 | LFG |
| Montenay Montgomery LP | PA | 32.1 | MSW |
| Montgomery County Resource Recovery | MD | 68 | MSW |
| Montgomery County Resource Recovery Facility | MD | 10 | MSW |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Moss | MD | 0.002 | SUN |
| Mossor1 | MD | 0.00608 | SUN |
| Mountain Rd | MD | 0.003 | SUN |
| Muehling | MD | 0.005 | SUN |
| Multitrade of Pittsylvania LP | VA | 80 | WDS |
| Murchie | MD | 0.002 | SUN |
| Murphy | MD | 0.003 | SUN |
| Neumann | MD | 0.002 | SUN |
| Nichols Tree Farm | MD | 0.01 | SUN |
| Nitchie | MD | 0.002 | SUN |
| O'Neill Residence | MD | 0.00552 | SUN |
| Owen Woods 1 | MD | 0.00116 | SUN |
| P.H. Glatfelter - Spring Grove | PA | 109.68 | BLQ |
| Parker Residence | MD | 0.0072 | SUN |
| Parrish | MD | 0.003 | SUN |
| PE POTTSTOWN 1 LF | PA | 6.2 | LFG |
| PE SE CHES CO REFUSE 1 LF | PA | 0.84 | LFG |
| Peoples Generating Station | MI | 2.4 | LFG |
| PEP RITCHIE BROWN 2 LF | MD | 4.2 | LFG |
| PEP RITCHIE PG COGEN 1 | MD | 2.5 | LFG |
| PH Glatfelter -Chillicothe | OH | 92.8 | BLQ |
| Piney | PA | 20 | WAT |
| PL FREY FARM LF | PA | 3.2 | LFG |
| PL LOCUST RIDGE 2 WF | PA | 102 | WND |
| PL N LBNON 1 LF | PA | 3.2 | LFG |
| Plater | MD | 0.003 | SUN |
| PN ALLEGHENY RIDGE 1 WF | PA | 80 | WND |
| PN ARMENIA MOUNTAIN 1 WF | PA | 100.5 | WND |
| PN NORTHERN TIER 1 D | PA | 1.6 | LFG |
| PN SHIPPENSBURG 1 LF | PA | 6.4 | LFG |
| PN SHIPPENSBURG 1 LF | PA | 6.4 | LFG |
| Polikov Solar | MD | 0.004 | SUN |
| Polk Residence Solar | MD | 0.0115 | SUN |
| Pong Orchard | MD | 0.0063 | SUN |
| Prechtl Residence | MD | 0.0042 | SUN |
| Price-Smithsburg | MD | 0.0035 | SUN |
| Prospect | NY | 18.08 | WAT |
| Pusey | MD | 0.0042 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Quad Cities | IL | 2 | LFG |
| Quinones | MD | 0.004 | SUN |
| Ramelmeier | MD | 0.0108 | SUN |
| Rao | MD | 0.002 | SUN |
| Reinhold | MD | 0.004 | SUN |
| Richard Payne and Susan Wood | MD | 0.004 | SUN |
| Richard Schmidt | MD | 0.00278 | SUN |
| Richmond Electric | VA | 3 | LFG |
| Roberts | MD | 0.0092 | SUN |
| Robertson Solar | MD | 0.0042 | SUN |
| Rock House | MD | 0.00414 | SUN |
| Rockford Electric | IL | 2 | LFG |
| Rockton Hydro Facility | IL | 1.1 | WAT |
| Rogers | MD | 0.004 | SUN |
| Romanko | MD | 0.00304 | SUN |
| Ross Residence | MD | 0.003 | SUN |
| Ross Shonat | MD | 0.00207 | SUN |
| Ross Solar Residence | MD | 0.0042 | SUN |
| Ruiz | MD | 0.003 | SUN |
| Safe Harbor | PA | 31.953 | WAT |
| Safe Harbor | PA | 38.55 | WAT |
| Safe Harbor | PA | 37.95 | WAT |
| Safe Harbor | PA | 38.55 | WAT |
| Safe Harbor | PA | 31.95 | WAT |
| Safe Harbor | PA | 32.55 | WAT |
| Safe Harbor | PA | 31.953 | WAT |
| Safe Harbor | PA | 32.55 | WAT |
| Safe Harbor | PA | 31.953 | WAT |
| Safe Harbor | PA | 32.55 | WAT |
| Safe Harbor | PA | 37.5 | WAT |
| Safe Harbor | PA | 38.55 | WAT |
| Salvo Auto Parts - Essex | MD | 0.0042 | SUN |
| Sanborn | MD | 0.0042 | SUN |
| Savin | MD | 0.003 | SUN |
| SAYREVIL | NJ | 22.25 | LFG |
| School Street | NY | 38 | WAT |
| Schwartz Solar | MD | 0.00456 | SUN |
| Settlers Hill | IL | 6.2 | LFG |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Shanley Residence | MD | 0.002 | SUN |
| Shanley-Sykesville | MD | 0.002 | SUN |
| Sharma | MD | 0.003 | SUN |
| Sherman Island | NY | 29.8 | WAT |
| Sherwood | MD | 0.006 | SUN |
| Shombert | MD | 0.005 | SUN |
| Shumaker Residence | MD | 0.002 | SUN |
| Sill Reisterstown | MD | 0.003 | SUN |
| Sill Upperco | MD | 0.002 | SUN |
| Silver-Isenstadt Solar | MD | 0.004 | SUN |
| Sklut | MD | 0.004 | SUN |
| Smearman Residence | MD | 0.00158 | SUN |
| Snowden Hydro Site | VA | 5 | WAT |
| Solar Bee | MD | 0.004 | SUN |
| SolarHomes | MD | 0.004 | SUN |
| South Barrington Electric | IL | 1.6 | LFG |
| Sparrows Point | MD | 129 | MSW |
| SPSA WTE | VA | 60 | MSW |
| Stadlin Residence | MD | 0.0029 | SUN |
| Stanton Residence | MD | 0.002 | SUN |
| Starrett | MD | 0.002 | SUN |
| Steele Residence | MD | 0.0042 | SUN |
| Stowe | PA | 6.2 | LFG |
| Strauss | MD | 0.003 | SUN |
| Summit School Solar | MD | 0.00507 | SUN |
| SunEdison Beltsville | MD | 0.016 | SUN |
| Tardif | MD | 0.014 | SUN |
| Tate Bethesda Solar PV | MD | 0.00684 | SUN |
| Teixeira's Home | MD | 0.00405 | SUN |
| Terry Dollarton | MD | 0.00351 | SUN |
| Tetter | MD | 0.001 | SUN |
| Thompson Residence | MD | 0.006 | SUN |
| Tillery | NC | 86 | WAT |
| Tom Neider Solar Residence | MD | 0.0063 | SUN |
| Trenton | NY | 27.8 | WAT |
| Union County Resource Recovery | NJ | 45 | MSW |
| Uppoor Residence | MD | 0.00385 | SUN |
| Venice Park Generating Facility | MI | 0.8 | LFG |
| Via Solar Residence | MD | 0.004 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

## Appendix E: Maryland Certified Renewable Energy Facilities (Cont'd)

| Plant Name | State | Capacity | Fuel |
|---|---|---|---|
| Vierling Home | MD | 0.002 | SUN |
| Viking Energy of Northumberland | PA | 18 | WDS |
| VP CRAVENWOOD 1 | NC | 47 | WDS |
| VP GOSPORT 1 F | VA | 60 | MSW |
| Wallace | MD | 0.001 | SUN |
| Walters | NC | 112 | WAT |
| Warshaw Solar One | MD | 0.003 | SUN |
| Wash 'N Vac III | MD | 0.0063 | SUN |
| Watts | MD | 0.005 | SUN |
| Welch/Molloy | MD | 0.017 | SUN |
| Westchester | IL | 3.5 | LFG |
| WGES 001 - Kelly Properties | MD | 0.1495 | SUN |
| Wheelabrator Baltimore Refuse | MD | 60.222 | MSW |
| Wheelabrator Falls | PA | 52.562 | MSW |
| Wheelabrator Gloucester LP | NJ | 14 | MSW |
| Whitmyre Residence | MD | 0.00684 | SUN |
| Wiker Residence | MD | 0.00294 | SUN |
| William Parker | MD | 0.0069 | SUN |
| Williamson roof | MD | 0.0049 | SUN |
| Wolfe Residence | MD | 0.0021 | SUN |
| Woodland | IL | 1.8 | LFG |
| Wright Solar Residence | MD | 0.002 | SUN |
| Yingling Roof | MD | 0.00358 | SUN |
| Youkers Roof | MD | 0.00276 | SUN |
| Young | MD | 0.003 | SUN |
| Zhang Residence | MD | 0.00675 | SUN |

Notes: These are the REFs that have been certified by the Commission, and registered in GATS of 1/14/2010. The rated capacity figure (in MWs) for the REFs is for the facility as a whole and does not partition out the amount attributable to renewable fuel sources.

### Fuel Source Key:

| | |
|---|---|
| BLQ | Black Liquor |
| LFG | Landfill Gas |
| MSW | Municipal Solid Waste |
| OBL | Other Biomass Liquids |
| SUN | Solar |
| WAT | Hydroelectric |
| WDS | Wood and Waste Solids |
| WND | Wind |

## Appendix F: Number of Renewable Energy Facilities Located in Maryland

| Maryland County | Tier 1 | Tier 1 Solar | Tier 2 | Total |
|---|---|---|---|---|
| Allegany | 1 | | | 1 |
| Anne Arundel | | 29 | | 29 |
| Baltimore | 1 | 33 | 3 | 37 |
| Baltimore City | 1 | 3 | | 4 |
| Calvert | | 5 | | 5 |
| Carroll | | 12 | | 12 |
| Cecil | | 5 | | 5 |
| Charles | | 1 | | 1 |
| Dorchester | | 1 | | 1 |
| Frederick | | 10 | | 10 |
| Garrett | | | 1 | 1 |
| Harford | | 7 | 1 | 8 |
| Howard | | 39 | | 39 |
| Kent | | 3 | | 3 |
| Montgomery | 2 | 79 | 2 | 83 |
| Prince George's | 4 | 19 | | 23 |
| Queen Anne's | | 3 | | 3 |
| Somerset | | 1 | | 1 |
| St. Mary's | | 6 | | 6 |
| Talbot | 1 | 4 | | 5 |
| Washington | | 16 | | 16 |
| Wicomico | 1 | 3 | | 4 |
| Worcester | 1 | 1 | | 2 |
| **Grand Total** | **12** | **280** | **7** | **299** |

Note: This list includes all renewable generators that are both: 1) located within the state of Maryland, and 2) registered to participate in any one of the PJM States' renewable energy programs as of January 22, 2010. This list does not correspond to the facilities listed in Appendix E.

## Appendix G: Capacity of Renewable Energy Facilities Located in Maryland (in MWs)

| Maryland County | Tier 1 | Tier 1 Solar | Tier 2 | Total |
|---|---|---|---|---|
| Allegany | 65.000 | | | 65.000 |
| Anne Arundel | | 0.363 | | 0.363 |
| Baltimore | 3.000 | 1.268 | 318.222 | 322.490 |
| Baltimore City | 3.000 | 0.009 | | 3.009 |
| Calvert | | 0.033 | | 0.033 |
| Carroll | | 0.350 | | 0.350 |
| Cecil | | 0.024 | | 0.024 |
| Charles | | 0.003 | | 0.003 |
| Dorchester | | 0.004 | | 0.004 |
| Frederick | | 0.103 | | 0.103 |
| Garrett | | | 32.660 | 32.660 |
| Harford | | 0.026 | 474.000 | 474.026 |
| Howard | | 0.163 | | 0.163 |
| Kent | | 0.011 | | 0.011 |
| Montgomery | 3.240 | 1.154 | 78.000 | 82.394 |
| Prince George's | 13.400 | 0.238 | | 13.638 |
| Queen Anne's | | 0.011 | | 0.011 |
| Somerset | | 0.004 | | 0.004 |
| St. Mary's | | 0.021 | | 0.021 |
| Talbot | 69.000 | 0.020 | | 69.020 |
| Washington | | 0.372 | | 0.372 |
| Wicomico | 6.000 | 0.019 | | 6.019 |
| Worcester | 2.000 | 0.004 | | 2.004 |
| **Grand Total** | 164.64 | 4.20 | 902.88 | 1,071.72 |

Note: This list includes all renewable generators that are both: 1) located within the state of Maryland, and 2) registered to participate in any one of the PJM States' renewable energy programs as of January 22, 2010. This list does not correspond to the facilities listed in Appendix E.

## Appendix H: RPS History

The Renewable Energy Portfolio Standard (RPS) was established in May 2004 by Senate Bill 869. In Case No. 9019,[1] the Commission considered certain threshold policy and administrative issues. With Case No. 9019 as a foundation, Staff convened the RPS Working Group which was composed of representatives from electric utilities, electricity suppliers, renewable energy supplier, Renewable Energy Credit (REC) brokers, industry specialists, environmentalists, the Maryland Office of People's Counsel, and other stakeholders.

On April 13, 2005, Staff filed recommended RPS regulations, and the Commission opened Rulemaking 12.[2] The Commission received comments and held open meetings concerning the regulations. On May 25, 2005, the Commission voted to publish the proposed RPS regulations as Section 20.61 of the Code of Maryland Regulations (COMAR). COMAR 20.61 was adopted and became effective November 24, 2005.

The Commission created regulations and procedures necessary to begin program implementations. The Commission also established a website dedicated to the RPS.[3] The website includes: forms, reference documents, related links, Frequently Asked Questions, applications for retroactive RECs and applications to be classified as industrial process load.

### 2006 RPS Compliance Year

The first RPS compliance year began on January 1, 2006, and concluded on December 31, 2006. In addition to initiating the Tier 1 and Tier 2 REC requirements for retail electricity sales, the issuance of retroactive RECs concluded during the year and changes were made to the RPS regulations through Rulemaking 25.

### 1. Registration of Retroactive RECs

RECs created on or after January 1, 2004 and before final regulations were adopted on November 24, 2005 are known as retroactive RECs. A retroactive REC application was required to be filed within the six-month period immediately after the effective date of the final regulations. These retroactive RECs were partitioned into two categories, one category to account for generation that occurred during calendar year 2004, and the second category to cover the period spanning January 1, 2005, through November 24, 2005.

The deadline for filing applications requesting credit for 2004 and 2005 retroactive RECs was May 29, 2006. Retroactive RECs are identical to RECs in every way except that they are given a generation date of December 31st of the year they were generated as opposed to a generation date consisting of the month and year that the renewable electricity was created. Like normal RECs, retroactive RECs can be banked for a period of three years.

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1 In the Matter of the Commission's Inquiry into the Implementation of the Renewable Energy Portfolio Standard, Case No. 9019.

2 COMAR 20.61 - Renewable Energy Portfolio Standards, Administrative Docket RM12.

3 Maryland Public Service Commission, Available: http://webapp.psc.state.md.us/intranet/ElectricInfo/home_new.cfm

The Commission approved 2,768,537 Tier 1 RECs and 3,972,563 Tier 2 RECs that were generated during 2004. The figures for 2005 retroactive RECs certified by the Commission were 762,520 Tier 1 RECs, and 339,627 Tier 2 RECs.

## 2. Rulemaking 25

Rulemaking 25 proposed revisions to COMAR 20.61 and were adopted on December 6, 2006. The due date for electricity supplier annual compliance forms was brought forward from June 1, 2007, to April 1, 2007. In some cases, REC creation cannot be verified by the operator of the control area. Rulemaking 25 developed a procedure to issue RECs for a facility when the control area operator is unable to certify the total number of MWh generated by the facility. Facilities unable to obtain REC authentication may include those that operate behind the meter, deliver electricity directly to an interconnecting utility, or operate in a Regional Transmission Organization that could not verify electricity generation over a given time period.

### 2007 RPS Compliance Year

On October 19, 2007, a Solar Technical Conference was held at the Commission. The purpose of this conference was to convene a number of solar energy market participants to share information and ideas regarding a number of issues that may relate to the solar requirements. Topics discussed during the Solar Technical Conference included an overall background of the solar market, experiences from other state solar RPS programs, available REC trading platforms, and methods for metering and verifying renewable solar energy generation. Rulemaking 32 proposed regulations for COMAR 20.61 to address issues created by the solar statutory changes. The regulations were adopted on September 4, 2008.

### Statutory Changes

### 2008 Legislative Session

During the 2008 Maryland Legislative Session three bills were passed which amend the RPS. The changes include: increasing the percentage requirements of the RPS; increasing Tier 1 compliance fees; restricting the geographic location of eligible renewable resources; establishing the Energy Fund and a Maryland Strategic Energy Investment Program; repealing the Maryland Renewable Energy Fund; and moving poultry litter from Tier 2 source to Tier 1.

Senate Bill 209 (Chapters 125 and 126 of 2008) increased the RPS requirements for Tier 1 renewable sources. Beginning in 2011, the Tier 1 requirements are accelerated to 20 percent by 2022. This approximately doubles the previous 2022 requirement of 9.5 percent. In addition, the Tier 1 compliance fee for REC shortfalls increased from 2 cents to 4 cents per kilowatt hour. Chapters 125 and 126 also restrict acceptable renewable energy sources to those within the PJM region, or in a control area that is adjacent to the PJM region if the electricity is delivered in the PJM region. The bill removes the provision that acceptable facilities may be located in a state adjacent to the PJM region.

Senate Bill 268 (Chapters 127 and 128 of 2008) established the Energy Fund, as well as a Maryland Strategic Energy Investment Program administered by the Maryland Energy Administration. The purpose of the Energy Fund is to decrease energy demand and increase energy supply to promote affordable, reliable and clean energy in Maryland. Chapters 127 and 128 repeal the Maryland Renewable Energy Fund and redirects revenues into a dedicated fund source within the new Energy Fund. The Energy Fund is also made up of the proceeds from the RGGI auction.

Senate Bill 348 (Chapters 135 and 136 of 2008) removed the incineration of poultry litter from the list of eligible Tier 2 renewable energy sources and added poultry litter-to-energy as a qualifying Tier 1 renewable energy source. Poultry litter-to-energy is an eligible resource only if the source is connected with the electric distribution grid serving Maryland.

**2007 Legislative Session**

In April 2007 the RPS was amended to add a solar set-aside to the Maryland RPS.[4] The solar set-aside mandated that a specified percentage of Tier 1 must come from attributes associated with electricity generated from a solar technology. This requirement became effective on January 1, 2008. The initial solar requirement is 0.005 percent in 2008. The solar requirement increases each year and peaks in year 2023, at which time 2 percent of Maryland retail electricity sales must be represented by a solar source. Also, double credit for RECs derived from solar sources is no longer allowed.

Solar RECs (SRECS) purchased by a Load Serving Entity (LSE) directly from a solar on-site generator must be done through a contract with a term of no less than 15 years.[5] The price level of the SRECs may vary throughout the life of the 15 year contract. For a solar on-site generator that is rated 10 kW or less, RECs must be purchased through a single initial payment representing the full estimated production of the system for the life of the contract.

Effective January 1, 2012, all SRECs must be sourced from solar renewable energy facilities that are interconnected with the electricity distribution grid serving Maryland.[6] On or before December 31, 2011, SRECs from out-of-state resources may be used for compliance only if no sufficient offers have been made from Maryland sources. SRECs eligible for the RPS must be generated by a Commission certified facility, meaning that an out-of-state solar facility must be approved by the Commission for the creation of SRECs to be eligible for compliance with the solar portion of the RPS. Also, solar facilities located within Maryland must first offer to sell SRECs to LSEs participating in the Maryland RPS before selling SRECs out-of-state.[7] If the offer is not accepted by an electricity LSE, then the SRECs may be sold for a purpose other than for compliance with the Maryland RPS. If the costs incurred by an LSE to purchase SRECs equals one percent of the total annual electricity sales revenue in Maryland, then the electricity LSE may request that the Commission delay the solar requirement for one year. The compliance

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4 SB 595 was passed by the General Assembly on April 9, 2007 and signed by Governor O'Malley on April 24, 2007.

5 See PUC Article §7-709.

6 See PUC Article §7-704.

7 See PUC Article §7-704(a)(2).

fee for the solar Tier 1 set-aside begins at $450 per MWh shortfall in 2008 and then starting in 2009, gradually reduces by $50 per MWh every other year until 2023, at which time the compliance fee is $50 per MWh. The RPS allocates a separate compliance fee schedule for Industrial Process Load. The entire Tier 1 Industrial Process Load obligation, including the solar portion, is subject to a compliance fee rate of $8 per MWh.